

# SULPHUR

**North African phosphates**

**Caprolactam and ammonium sulphate**

**Gearing up for lower emissions**

**SRU overpressure protection**

In our regular column from The Sulphur Institute, TSI Communications Manager Joshua Maak reflects on the organisation's *Sulphur – an advantaged element®* campaign.



# Is sulphur an advantaged element?

“It is yellow and it smells like rotten eggs” is not uncommonly what many people comment when asked about sulphur. Here at The Sulphur Institute, we are working to improve the image and understanding of this key aspect of our everyday lives. Our recent *Sulphur – an advantaged element®* campaign seeks to bring positive information about sulphur and its importance to the public by explaining its role in three areas:

- Increasing agricultural productivity
- Reclaiming marginal soils
- Supporting infrastructure

It is expected that by 2050 growth in population and calorie consumption will double global food demand. According to the UN Food and Agriculture Organisation, improved crop yields will account for 70% of production growth in developing countries, and for developed nations that percentage increases to nearly all growth. Achieving these high yields will necessitate increased rates of fertilizer consumption, and sulphur will be essential to meeting those targets. Approximately 50% of sulphur consumption is within the fertilizer industry; namely the production of phosphorus fertilizers or as a fertilizer in its own right. Sadly, sulphur deficient soils often occur in regions where food security is most challenged, but this also provides an opportunity. For example, in West Africa, sulphur fertilisation increased per hectare yields of peanuts, maize, and other crops by up to 45% in multiple tests! Even in more developed regions like the North American Corn Belt, judicious

sulphur fertilizer application increased corn yields by 11%. Sulphur – *an advantaged element®* is helping feed the world through increasing agricultural productivity.

The UN Department of Economic and Social Affairs estimates that nearly all population growth for the next four decades will be centred in urban areas, resulting in an urban population increase of 72% by 2050. This on-going urbanisation, and the food security challenges outlined earlier, will place a tremendous pressure on the earth's arable land mass. Farmers often find themselves utilising degraded soils, soils that can under certain conditions such as high alkalinity, benefit from the addition of elemental sulphur. Soils with excessively high pH are poor in health and can actually limit the effectiveness of fertilizers by reducing the uptake of nutrients. Thankfully, sulphur can help in the reclamation of marginal soils and lands affected by soil degradation. Sulphur application improves the plant root environment allowing a more favourable environment and increasing the uptake of fertilizers by amending soil pH. Sulphur – *an advantaged element®* is improving and increasing the land available for cultivation.

Urbanisation creates strains on infrastructure beyond agriculture. Concrete, a CO<sub>2</sub> and water intensive product, is the most used synthetic construction material in the world, equivalent to twice the volume of all other building materials combined. Using molten sulphur as a binder in place of Portland cement can reduce

the CO<sub>2</sub> released and largely eliminate the use of water. This sulphur-based concrete performs as well as the cement-based product in certain applications while offering superior resistance to corrosion and an improved service life. Sulphur's use in construction materials is not limited to concrete; it has applications as an asphalt binder. By replacing up to 30% of the asphalt binder with sulphur, blacktop roads can be laid with less energy resources and at lower temperatures. Similarly to the concrete, sulphur asphalt is less prone to rutting and lasts longer thus requiring fewer repairs. Sulphur – *an advantaged element®* supports infrastructure by contributing to longer lasting materials that are manufactured with a lower environmental impact.

Sulphur is a critical aspect of life today and it will become incredibly more important to our future. As population and urbanisation grows, greater pressure will be placed on our already strained agricultural systems requiring an increased amount and specialization of fertilizer. Arable land will need to be preserved and rehabilitated to facilitate support of improved crop yields. Sustainability in agriculture must be matched in infrastructure through the use of materials with longer service lives and lower environmental impacts. Sulphur is clearly not just yellow and TSI has rightfully labelled it *Sulphur – an advantaged element®*.

Learn more about Sulphur – an advantaged element® and see our video on our website: [www.sulphurinstitute.org/advantaged](http://www.sulphurinstitute.org/advantaged)